

New claims 25 - 34 have been added more completely to define the invention. All of the added claims are directed to the elected invention. Claim 25 is a combination of original claims 1 and 2. Claim 26 incorporates certain of the recitations from original claim 3. The recitations in claims 27 - 29 draw support from the specification as filed at, for example, page 8, lines 20 - 27 and original claim 4. The recitations in claims 30 - 34 contain the alternative recitations in original claims 6 and 8 respectively. Claims 2, 7, 13, 14 and 18 - 23 have been cancelled without prejudice to Applicants' right to file a continuation or divisional application directed thereto.

Claim 9 has been amended to remove the basis for the rejection to this claim under 35 USC 112, second paragraph. Claim 10 has been amended in a manner courteously suggested by the Examiner to remove the basis for the rejection to claim 11 under 35 USC 101.

Claims 1 and 4 - 15 were rejected under 35 USC 112, first paragraph because the specification allegedly does not provide enablement commensurate in scope with these claims. Applicants respectfully traverse this rejection.

The Examiner contends that the specification only provides guidance regarding the use of the trehalase inhibitor validamycin A to allow trehalose accumulation in tobacco and potato. As support for this contention, the Examiner has noted that the specification does not contain an example for cloning of the nucleotide sequence of the trehalase inhibitor from cockroach or its expression in transgenic plants to show if it causes the accumulation of trehalose. In response, Applicants first note that the claims have been amended to delete all reference to the trehalase inhibitor protein from cockroach. More significantly, Applicants note that Section 112 requires

the specification to "enabling" only to a person of skill in the art. The present specification provides such person of skill in the art with guidance as to the cloning of cDNA encoding trehalase from Solanaceae (see Examples 4 and 5), as to the overexpression of such a trehalase cDNA (see Example 6) and as to the transformation of a plant with an antisense trehalase construct (see Example 7). Moreover, the specification presents evidence to show that inhibition of trehalase activity enhances the production of trehalose. Although the specification shows this by way of the administration of a chemical compound (validamycin), those of skill in the art could routinely use the guidance provided by the specification to inhibit trehalase with other inhibitors and using other plant transformation methods.

While the Examiner has mentioned some problems that may arise in the expression of foreign genes in transgenic plants, it is respectfully submitted that the reasoning and citations provided by the Examiner are not sufficient for the U.S. Patent and Trademark Office to shift to Applicants the burden of showing enablement. It is settled law that, when rejecting a claims under the enablement requirement of Section 112, the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by a claim is not adequately enabled by the description of the invention provided in the specification of the application. *In re Wright*, 27 USPQ 2d 1510 (Fed. Cir. 1993), citing *In re Marzocchi*, 169 USPQ 367 (CCPA 1971). This includes, of course, providing sufficient reasons for doubting any assertion in the specification to the scope of enablement. *Wright, supra* at 1513. Only if the PTO meets this burden does the burden then shift to the Applicant to provide suitable proof indicating that the specification is indeed enabling.

In the present case, it is respectfully submitted that the U.S. Patent and Trademark Office

has not set forth a sufficient basis for showing that one of skill in the art would have required anything more than routine (not undue) experimentation to practice the invention as now claimed in light of the guidance provided by the present specification.

The Examiner rejected claims 1, 6, 9 - 10 and 13 - 14 under 35 USC 102(b) as allegedly being anticipated by Kendall, et al. The Examiner rejected claims 1, 4 - 6 and 8 - 15 under 35 USC 103(a) as allegedly being patentable over Kendall, et al in view of Belknap, et al. Applicants respectfully traverse these rejections.

According to the Examiner, Kendall, et al allegedly teach the accumulation of trehalose in tissue treated with validamycin A. This teaching presumably is derived from Fig. 2 and the Materials and Method section of the reference. Applicants respectfully submit that the Examiner has misread the article of Kendall, et al. The reference only teaches that validamycin inhibits the trehalase activity which can be found in plant tissue. This is demonstrated in an assay in which trehalose is added to the tissue suspension medium, which is then subsequently degraded by the endogenous trehalase. The reference does not show, nor suggest, that inhibition of the endogenous trehalase can be used to accumulate trehalose *in vivo*. See, e.g., Kendall, et al at last sentence of first column on page 2527 ("naturally occurring trehalose was not detected in the plant materials in this study"). The only information that can be derived from the data presented by Kendall, et al is that some plants contain active trehalase activity. As discussed below, it would not have been obvious from this reference that blocking this activity would accumulate trehalose production in plants.

It cannot be said that Kendall, et al renders the claimed invention obvious. First of all,

it was not known whether validamycin would have the same inhibiting effects *in vivo* as demonstrated *in vitro* experiments of Kendall, et al. For example, it was not known, nor could it be derived from Kendall, et al, if validamycin would be able to enter the plant cells to exert its inhibitory properties locally.

Accordingly, one of skill in the art could not predict from any of the cited references with even a reasonable expectation of success whether inhibiting the action of trehalase *in vivo* would result in an increase of trehalose content in the plant cells. One of skill in the art would not know whether the (transgenic) production of trehalose would take place in a cell compartment other than the compartment containing the trehalase enzyme. It must be remembered in this respect that the trehalase produced by plants does not naturally act on trehalose produced by the plant. The mechanism by which the trehalase in plants operates, was not known to those of skill in the art (see generally Kendall, et al at page 2527.) Accordingly, it could not have been known whether the inhibition of trehalase would have affected accumulation of trehalose produced by the plant. For this reason, among others, the evidence in the present specification that shows that it is possible to increase the trehalose content of a plant by inhibiting the trehalase activity could not have been expected from the cited references.

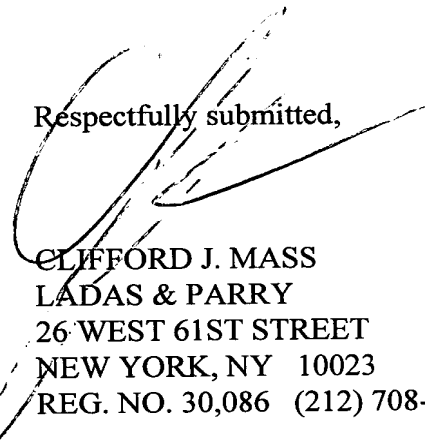
The Examiner rejected claims 1, 4 - 5 and 7 - 15 under 35 USC 103(a) as allegedly being unpatentable over Belknap, et al in view of Hayakawa, et al and Ausubel, et al. Applicants respectfully traverse this rejection.

It is respectfully submitted that the cited references are not properly combinable to set forth an alleged *prima facie* case of obviousness for the reasons discussed above. There is no

motivation, absent the hindsight provided by the present specification, to combine the references in the manner proposed by the Examiner to arrive at a process for the accumulation of trehalose in plant tissues. In any event, for the reasons discussed above, one of skill in the art would not have had even a reasonable expectation that such a process would have been successful in achieving an accumulation of trehalose in plant tissues.

In view of the above, all rejections and objections of record are believed to have been successfully traversed and the application is believed to be in allowable form. An early Notice of Allowability is earnestly solicited and is believed to be fully warranted.

Respectfully submitted,



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